

AMENDMENT TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1-78. (Cancelled)

79. (Previously presented) The recognition molecule according to claim 89 wherein the antibody framework sequence comprises

a) FRH1, FRH2, FRH3 and FRH4 (SEQ ID NO: 82) comprising the following amino acid sequences, the amino acid position corresponding to the numbering according to Kabat:

for FRH1 in position (SEQ ID NO: 84)	1	E
	2	V
	3	K
	4	L
	5	V
	6	E
	7	S
	8	G
	9	G
	10	G
	11	L
	12	V
	13	Q
	14	P
	15	G
	16	G
	17	S
	18	M
	19	K

	20	L
	21	S
	22	C
	23	A or V
	24	A, V, S or T
	25	S
	26	G
	27	Y, F, S or D
	28	T
	29	F, L or I
	30	S
for FRH2 in position (SEQ ID NO: 85)	36	W
	37	V
	38	R
	39	Q
	40	S
	41	P
	42	E
	43	K
	44	G
	45	L
	46	E
	47	W
	48	V
	49	A
for FRH3 in position (SEQ ID NO: 86)	66	R
	67	F
	68	T
	69	I
	70	S
	71	R

	72	D
	73	D or V
	74	S
	75	K
	76	S
	77	S
	78	V
	79	Y or S
	80	L
	81	Q
	82	M
	82a	N
	82b	N
	82c	L
	83	R
	84	A or V
	85	E
	86	D
	87	T
	88	G
	89	I
	90	Y
	91	Y
	92	C
	93	T
	94	R, G, N, K or S
for FRH4 in position (SEQ ID NO: 87)	103	W
	104	G
	105	Q
	106	G
	107	T

108	T
109	L
110	T
111	V
112	S
113	S or A

and

b) FRL1, FRL2, FRL3 and FRL4 (SEQ ID NO: 83) comprising the following amino acid sequences, the amino acid position corresponding to the numbering according to Kabat:

for FRL1 in position (SEQ ID NO: 88)	1	D
	2	I, V or L
	3	V
	4	M or L
	5	T
	6	Q
	7	T or A
	8	P or A
	9	L or F
	10	S
	11	L or N
	12	P
	13	V
	14	S or T
	15	L
	16	G
	17	D or T
	18	Q or S
	19	A
	20	S
	21	I
	22	S

	23	C
for FRL2 in position (SEQ ID NO: 89)	35	W
	36	Y
	37	L
	38	Q
	39	K
	40	P
	41	G
	42	Q or L
	43	S
	44	P
	45	K or Q
	46	L
	47	L
	48	I or V
	49	Y
for FRL3 in position (SEQ ID NO: 90)	57	G
	58	V
	59	P
	60	D
	61	R
	62	F
	63	S
	64	G or S
	65	S
	66	G
	67	S
	68	G
	69	T
	70	D
	71	F

	72	T
	73	L
	74	K or R
	75	I
	76	S
	77	R
	78	V
	79	E
	80	A
	81	E
	82	D
	83	L or V
	84	G
	85	V
	86	Y
	87	Y
	88	C
for FRL4 in position (SEQ ID NO: 91)	98	F
	99	G
	100	G or D
	101	G
	102	T
	103	K
	104	L
	105	E
	106	I or L
	106a	K
	107	R
	108	A.

80. (Previously presented) The recognition molecule according to claim 95 which comprises

SEQ ID NO: 33 and SEQ ID NO: 35, or a humanized variant thereof.

81. (Previously Presented) The recognition molecule according to claim 90 which comprises a single-chain antibody fragment, a multibody, a Fab fragment, a fusion protein of an antibody fragment with a peptide or a protein or an immunoglobulin molecule of the IgG, IgM, IgA, IgE, IgD isotype or a subclass thereof.

82. (Previously presented) A construct comprising the recognition molecule of claim 81 which is fused, chemically coupled, covalently or non-covalently associated with

- (i) an immunoglobulin domain of various species,
- (ii) an enzyme molecule,
- (iii) an interaction domain,
- (iv) a domain for stabilization,
- (v) a signal sequence,
- (vi) a fluorescent dye,
- (vii) a toxin,
- (viii) a catalytic antibody,
- (ix) an antibody molecule or a fragment with different specificity,
- (x) a cytolytic component,
- (xi) an immunomodulator,
- (xii) an immunoeffector,
- (xiii) an MHC class I or class II antigen,
- (xiv) a chelating agent for radioactive labeling,
- (xv) a radioisotope,
- (xvi) a liposome,
- (xvii) a transmembrane domain,
- (xviii) a virus or
- (xix) a cell.

83. (Previously presented) A method for the production of the recognition molecule according to claim 87, comprising:

- (i) incorporating one or more nucleic acid molecules encoding the amino acid sequence of at least one recognition molecule in a virus or in a host cell;
- (ii) culturing the host cells or viruses under suitable conditions; and
- (iii) obtaining the recognition molecule from the effector cell bearing the recognition molecule or the virus, wherein said recognition molecule specifically binds to the glycosylated MUC 1 tumor epitope.

84. (Cancelled)

85. (Previously presented) The method according to claim 93, wherein the recognition molecule comprises an immunoglobulin IgG molecule or a fragment thereof.

86. (Previously presented) The method according to claim 93, wherein the recognition molecules comprise a multibody.

87. (Previously presented) A recombinant recognition molecule which comprises the amino acid sequences set forth in SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 5, SEQ ID NO: 7, SEQ ID NO: 9 and SEQ ID NO:11 and which specifically binds to a glycosylated MUC1 tumor epitope.

88. (Currently Amended) A recombinant recognition molecule comprising the amino acid sequences set forth in (a)-(f), wherein

(a) comprises SEQ ID NO. 1 or an equivalent canonical structure variant thereof ~~wherein one or two amino acids are replaced by an amino acid with analogous physicochemical properties, wherein the equivalent canonical structure variant of SEQ ID NO: 1 comprises SEQ ID NO: 17, SEQ ID NO: 18, SEQ ID NO: 19, or SEQ ID NO: 20;~~

(b) comprises SEQ ID NO. 3 or an equivalent canonical structure variant thereof ~~wherein one or two amino acids are replaced by an amino acid with analogous physicochemical properties, wherein the equivalent canonical structure variant of SEQ ID NO: 3 comprises SEQ ID NO: 21;~~

(c) comprises SEQ ID NO. 5;

(d) comprises SEQ ID NO. 7 or an equivalent canonical structure variant thereof ~~wherein one or two amino acids are replaced by an amino acid with analogous physicochemical properties, wherein the equivalent canonical structure variant of SEQ ID NO: 7 comprises SEQ ID NO: 24, SEQ ID NO: 25, or SEQ ID NO: 26;~~

(e) comprises SEQ ID NO. 9; and

(f) comprises SEQ ID NO. 11 or an equivalent canonical structure variant thereof ~~wherein one or two amino acids are replaced by an amino acid with analogous physicochemical properties, wherein the equivalent canonical structure variant of SEQ ID NO: 11 comprises SEQ ID NO: 30;~~

and wherein the recognition molecule specifically binds to a glycosylated MUC1 tumor epitope.

89. (Previously presented) The recognition molecule according to claim 87 further comprising one or more antibody framework sequences which separate, enclose and/or flank said amino acid sequences.

90. (Previously presented) The recognition molecule according to claim 87, which comprises SEQ ID NO:32 and SEQ ID NO:34, or a humanized variant thereof.

91. (Currently Amended) The recognition molecule according to claim 87, which comprises

- (i) at least one sequence set forth in SEQ ID NOs 36 to 47,
 - (ii) SEQ ID NO: 60 and SEQ ID NO: 62,
 - (iii) SEQ ID NO: 64 and SEQ ID NO: 66, or
 - (iv) SEQ ID NO:66 and SEQ ID NO: 68,
- or a humanized variant thereof.

92. (Previously presented) A composition comprising

- (i) at least one recognition molecule according to claim 87; and/or
- (ii) at least one construct comprising the recognition molecule of claim 87 which is fused, chemically coupled, or covalently or non-covalently associated with
 - (i) an immunoglobulin domain of various species,
 - (ii) an enzyme molecule,

- (iii) an interaction domain,
- (iv) a domain for stabilization,
- (v) a signal sequence,
- (vi) a fluorescent dye,
- (vii) a toxin,
- (viii) a catalytic antibody,
- (ix) an antibody molecule or a fragment with different specificity,
- (x) a cytolytic component,
- (xi) an immunomodulator,
- (xii) an immunoeffector,
- (xiii) an MHC class I or class II antigen,
- (xiv) a chelating agent for radioactive labeling,
- (xv) a radioisotope,
- (xvi) a liposome,
- (xvii) a transmembrane domain,
- (xviii) a virus or
- (xix) a cell;

and/or

- (iii) at least one nucleic acid molecule which encodes the recognition molecule of claim 87; together with a pharmaceutically tolerable carrier and/or adjuvant.

93. (Previously presented) A method for diagnosing, reducing, treating, following-up and/or after-caring tumor diseases and/or metastases in a subject in need thereof comprising administering to said subject a recognition molecule according to claim 87.

94. (Previously presented) An *in vitro* method for the diagnosis of a tumor comprising detecting a glycosylated MUC1 tumor epitope with at least one recognition molecule according to claim 87.

95. (Previously presented) A recombinant recognition molecule comprising an amino acid sequence which contains the amino acid sequences of SEQ ID NO: 2, SEQ ID NO: 4, SEQ ID

NO: 6, SEQ ID NO: 8, SEQ ID NO: 10 and SEQ ID NO:12 and which specifically binds to a glycosylated MUC1 tumor epitope.

96. (Currently Amended) A recombinant recognition molecule comprising the amino acid sequences set forth in (a)-(f), wherein

(a) comprises SEQ ID NO. 2 or an equivalent canonical structure variant thereof ~~wherein one or two amino acids are replaced by an amino acid with analogous physicochemical properties,~~
wherein the equivalent canonical structure variant of SEQ ID NO: 2 comprises SEQ ID NO: 13, SEQ ID NO: 14, SEQ ID NO: 15, or SEQ ID NO: 16;

(b) comprises SEQ ID NO. 4 or an equivalent canonical structure variant thereof ~~wherein one or two amino acids are replaced by an amino acid with analogous physicochemical properties,~~
wherein the equivalent canonical structure variant of SEQ ID NO: 4 comprises SEQ ID NO: 22 or SEQ ID NO: 23;

(c) comprises SEQ ID NO. 6;

(d) comprises SEQ ID NO. 8 or an equivalent canonical structure variant thereof ~~wherein one or two amino acids are replaced by an amino acid with analogous physicochemical properties,~~
wherein the equivalent canonical structure variant of SEQ ID NO: 8 comprises SEQ ID NO: 27, SEQ ID NO: 28, or SEQ ID NO: 29;

(e) comprises SEQ ID NO. 10; and

(f) comprises SEQ ID NO. 12 or an equivalent canonical structure variant thereof ~~wherein one or two amino acids are replaced by an amino acid with analogous physicochemical properties,~~
wherein the equivalent canonical structure variant of SEQ ID NO: 12 comprises SEQ ID NO: 31;

and wherein the recognition molecule specifically binds to a glycosylated MUC1 tumor epitope.

97. (Previously presented) The recognition molecule according to claim 95 further comprising one or more antibody framework sequences which separate, enclose and/or flank said amino acid sequences.

98. (Previously Presented) The recognition molecule according to claim 97, wherein the antibody framework sequence comprises

a) FRH1, FRH2, FRH3 and FRH4 (SEQ ID NO: 82) comprising the following amino acid sequences, the amino acid position corresponding to the numbering according to Kabat:

for FRH1 in position (SEQ ID NO: 84)	1	E
	2	V
	3	K
	4	L
	5	V
	6	E
	7	S
	8	G
	9	G
	10	G
	11	L
	12	V
	13	Q
	14	P
	15	G
	16	G
	17	S
	18	M
	19	K
	20	L
	21	S
	22	C
	23	A or V
	24	A, V, S or T
	25	S
	26	G
	27	Y, F, S or D
	28	T
	29	F, L or I

	30	S
for FRH2 in position (SEQ ID NO: 85)	36	W
	37	V
	38	R
	39	Q
	40	S
	41	P
	42	E
	43	K
	44	G
	45	L
	46	E
	47	W
	48	V
	49	A
for FRH3 in position (SEQ ID NO: 86)	66	R
	67	F
	68	T
	69	I
	70	S
	71	R
	72	D
	73	D or V
	74	S
	75	K
	76	S
	77	S
	78	V
	79	Y or S
	80	L
	81	Q

	82	M
	82a	N
	82b	N
	82c	L
	83	R
	84	A or V
	85	E
	86	D
	87	T
	88	G
	89	I
	90	Y
	91	Y
	92	C
	93	T
	94	R, G, N, K or S
for FRH4 in position (SEQ ID NO: 87)	103	W
	104	G
	105	Q
	106	G
	107	T
	108	T
	109	L
	110	T
	111	V
	112	S
	113	S or A

and

b) FRL1, FRL2, FRL3 and FRL4 (SEQ ID NO: 83) comprising the following amino acid sequences, the amino acid position corresponding to the numbering according to Kabat:

for FRL1 in position (SEQ ID NO: 88)	1	D
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2	I, V or L
3	V
4	M or L
5	T
6	Q
7	T or A
8	P or A
9	L or F
10	S
11	L or N
12	P
13	V
14	S or T
15	L
16	G
17	D or T
18	Q or S
19	A
20	S
21	I
22	S
23	C
for FRL2 in position (SEQ ID NO: 89)	35 W
	36 Y
	37 L
	38 Q
	39 K
	40 P
	41 G
	42 Q or L
	43 S

	44	P
	45	K or Q
	46	L
	47	L
	48	I or V
	49	Y
for FRL3 in position (SEQ ID NO: 90)	57	G
	58	V
	59	P
	60	D
	61	R
	62	F
	63	S
	64	G or S
	65	S
	66	G
	67	S
	68	G
	69	T
	70	D
	71	F
	72	T
	73	L
	74	K or R
	75	I
	76	S
	77	R
	78	V
	79	E
	80	A
	81	E

	82	D
	83	L or V
	84	G
	85	V
	86	Y
	87	Y
	88	C
for FRL4 in position (SEQ ID NO: 91)	98	F
	99	G
	100	G or D
	101	G
	102	T
	103	K
	104	L
	105	E
	106	I or L
	106a	K
	107	R
	108	A.

99. (Previously presented) The recognition molecule according to claim 80, wherein it comprises a single-chain antibody fragment, a multibody, a Fab fragment, a fusion protein of an antibody fragment with peptides or proteins and/or an immunoglobulin molecule of the IgG, IgM, IgA, IgE, IgD isotype or a subclasses thereof.

100. (Previously presented) The recognition molecule according to claim 95, which comprises

- (i) at least one sequence set forth in SEQ ID NOs 48 to 59,
- (ii) SEQ ID NO:61 and SEQ ID NO:63,
- (iii) SEQ ID NO:65 and SEQ ID NO:69, or
- (iv) SEQ ID NO:67 and SEQ ID NO:69,

or humanized variants of said sequences.

101. (Previously presented) A construct comprising a recognition molecule according to claim 99 which is fused, chemically coupled, or covalently or non-covalently associated with

- (i) an immunoglobulin domain of various species,
- (ii) an enzyme molecule,
- (iii) an interaction domain,
- (iv) a domain for stabilization,
- (v) a signal sequence,
- (vi) a fluorescent dye,
- (vii) a toxin,
- (viii) a catalytic antibody,
- (ix) an antibody molecule or a fragment with different specificity,
- (x) a cytolytic component,
- (xi) an immunomodulator,
- (xii) an immunoeffector,
- (xiii) an MHC class I or class II antigen,
- (xiv) a chelating agent for radioactive labeling,
- (xv) a radioisotope,
- (xvi) a liposome,
- (xvii) a transmembrane domain,
- (xviii) a virus or
- (xix) a cell.

102. (Previously presented) A composition comprising

- (i) at least one recognition molecule according to claim 95; and/or
- (ii) a construct comprising at least one recognition molecule of claim 95 which is fused, chemically coupled, or covalently or non-covalently associated with
 - (i) an immunoglobulin domain of various species,
 - (ii) an enzyme molecule,
 - (iii) an interaction domain,
 - (iv) a domain for stabilization,
 - (v) a signal sequence,

- (vi) a fluorescent dye,
- (vii) a toxin,
- (viii) a catalytic antibody,
- (ix) an antibody molecule or a fragment with different specificity,
- (x) a cytolytic component,
- (xi) an immunomodulator,
- (xii) an immunoeffector,
- (xiii) an MHC class I or class II antigen,
- (xiv) a chelating agent for radioactive labeling,
- (xv) a radioisotope,
- (xvi) a liposome,
- (xvii) a transmembrane domain,
- (xviii) a virus or
- (xix) a cell;

and/or

- (iii) at least one nucleic acid molecule which encodes the recognition molecule of claim 95; together with a pharmaceutically tolerable carrier and/or adjuvant.

103. (Previously presented) A method for the production of recognition molecules according to claim 95 comprising

- (i) incorporating one or more nucleic acid molecules encoding the amino acid sequence of at least one recognition molecule according to claim 95 in a virus or in a host cell;
- (ii) culturing the host cells or viruses under suitable conditions; and
- (iii) obtaining the recognition molecule from the effector cell bearing the recognition molecule or construct, or the virus, which specifically recognize the glycosylated MUC 1 tumor epitope.

104. (Previously presented) A method for diagnosing, reducing, treating, following-up and/or after-caring tumor diseases and/or metastases in a subject in need thereof comprising administering to said subject a recognition molecule according to claim 95.

105. (Previously presented) The method according to claim 104, wherein the recognition molecule comprises an immunoglobulin IgG molecule or a fragment thereof.

106. (Previously presented) The method according to claim 104, wherein the recognition molecule comprises a multibody.

107. (Previously presented) An *in vitro* method for the diagnosis of a tumor comprising detecting a glycosylated MUC1 tumor epitope with at least one recognition molecule according to claim 95.

108. (Previously presented) A method for the production of the construct according to claim 82 comprising

- (i) incorporating one or more nucleic acid molecules encoding the amino acid sequence of at least one construct comprising said recognition molecule in a virus or in a host cell;
- (ii) culturing the host cells or viruses under suitable conditions; and
- (iii) obtaining the construct, the effector cell bearing the recognition molecule or construct, or the virus, which specifically recognize the glycosylated MUC 1 tumor epitope.

109. (Previously presented) A method for diagnosing, reducing, treating, following-up and/or after-caring tumor diseases and/or metastases in a subject in need thereof comprising administering to said subject a construct according to claim 82.

110. (Previously presented) An *in vitro* method for the diagnosis of a tumor comprising detecting a glycosylated MUC1 tumor epitope with at least one construct according to claim 82.

111. (Previously presented) A method for diagnosing, reducing, treating, following-up and/or after-caring tumor diseases and/or metastases in a subject in need thereof comprising administering to said subject a construct according to claim 92.

112. (Previously presented) An *in vitro* method for the diagnosis of a tumor comprising detecting a glycosylated MUC1 tumor epitope with at least one construct according to claim 92.

113. (Previously presented) The recognition molecule according to claim 87 wherein the glycosylated MUC1 tumor epitope comprises a glycosylated PDTRP (SEQ ID NO: 81) region within a MUC1 tandem repeat sequence and is glycosylated with GalNAc or Gal-GalNAc on the PDTRP (SEQ ID NO: 81) threonine.

114. (Previously presented) The recognition molecule according to claim 95 wherein the glycosylated MUC1 tumor epitope comprises a glycosylated PDTRP (SEQ ID NO: 81) region within a MUC1 tandem repeat sequence and is glycosylated with GalNAc or Gal-GalNAc on the PDTRP (SEQ ID NO: 81) threonine.

115. (Previously presented) The recognition molecule according to claim 113 wherein the glycosylated MUC1 tumor epitope comprises A[HGVTSAPDT(GalNAc α)RPAPGSTAPPA]_n wherein n=1, 3, or 5 (SEQ ID NO: 73).

116. (Previously presented) The recognition molecule according to claim 114 wherein the glycosylated MUC1 tumor epitope comprises A[HGVTSAPDT(GalNAc α)RPAPGSTAPPA]_n wherein n=1, 3, or 5 (SEQ ID NO: 73).

117-131. (Cancelled)